Abstract

Field-effect power transistor

The present invention provides a field-effect power transistor having a first semiconductor region (10) with first channels (20) having a large ratio of a channel width (w) to a channel length (l) for conducting through an electric current from a source terminal (17) to a drain terminal (11) in a manner dependent on a signal at a gate contact (10') of the first semiconductor region (10); at least one second semiconductor region (12) with second channels (22) having a small ratio of the channel width (w) to the channel length (l) for conducting through an electric current from the source terminal (17) to the drain terminal (11) in a manner dependent on a signal at the gate contact (12') of the second semiconductor region (12); and a drive terminal (16) for providing a drive signal at the gate contacts (10'; 12'), a first predetermined resistor (14) in each case being provided between the gate contact (12') of the at least second semiconductor region (12) and the drive terminal (16); and an overvoltage protection device (13) being provided at least between the gate contact (12') of the second semiconductor region (12) and the drain terminal (11), for the purpose of switching on the second semiconductor region (12) if the voltage between them exceeds a predetermined value.

Figure 1

List of reference symbols

10	First semiconductor region with large w/l per unit area
10'	Gate contact of the first semiconductor region
11	Drain terminal of the field-effect power transistor
12	Second semiconductor region with small w/l
12'	Gate contact of the second semiconductor region
13	Active zenering (zener diode)
14	First predetermined resistor
15	Gate resistor
16	Gate terminal of the field-effect power transistor
17	Source terminal of the field-effect power transistor
18	Second predetermined resistor
20	Channel of the first type
21	Polysilicon-filled trench, which forms the first predetermined resistor
22	Channel of the second type
23	Plated-through hole to gate metallization 10', 12'
24	Oxide lining of the trenches
25	Gate voltage supply
w	Channel width of a controllably conducting MOS channel
l	Channel length of a controllably conducting MOS channel